BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Applied Science Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science
Unit number and title	**Unit 22: Medical Physics Applications**
Learning aims	**A:** Explore the principles, production, uses and benefits of non-ionising instrumentation techniques in medical applications **B**: Explore the principles, production, uses and benefits of ionising instrumentation techniques in medical applications
Assignment title	**Radiation use in medical diagnosis and treatment**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	In order to support your application to study Diagnostic Radiography and Imaging at University, you have secured a placement within the Radiography Department of a teaching hospital. Your clinical placement will allow you to shadow the work of a qualified Radiographer and gain valuable experience in the uses of ionising and non-ionising radiation in the diagnosis and treatment of a variety of conditions. On completion of your placement, you will produce a presentation which will showcase your knowledge during University interviews.

Task	Produce a presentation that **justifies, compares and explains** the uses, principles and production of ionising and non-ionising radiation in medical applications. • Using your lesson notes and independent research, select at least **two** examples where ionising radiation techniques would be used **and** at least **two** conditions where non-ionising radiation techniques would be used in order to screen, diagnose and treat different named medical conditions. Present these cases by **justifying** the techniques used to screen and diagnose the condition and consequently, to treat the patient using each type of radiation therapy. Your

	presentation must also include consideration of the patients' c

	hoices and consent to the use of radiation therapy and techniques. • Demonstrate your knowledge of the principles, production and uses of different ionising and non-ionising radiation techniques as used in medical settings by **comparing** at least two methods that utilise ionising radiation (e.g. X-rays, Computerised (axial) Tomography (CT/CAT) scans, radiopharmaceuticals, radiotherapy, stereotactic radiosurgery (gamma knife), proton therapy) and at least two methods that utilise non-ionising radiation (e.g. Magnetic Resonance Imaging (MRI), Lasers, Optical Coherence Tomography (OCT), ultrasound), Infrared thermography (IRT). Your presentation must **compare** how each type of radiation is produced, the principles behind the use of named techniques and the benefits and limitations of each method. • Complete your presentation by producing fully labelled diagrams (or flow charts) that are clearly linked to **explanations** of the principles, production and uses of at least two ionising and at least two non-ionising radiation technologies. Give a clear account to **explain** why these specific ionising and non-ionising radiation technologies are used in the diagnosis and treatment of human medical conditions.
Checklist of evidence required	A presentation that includes: • Justification of the use of ionising and non-ionising radiation in medical settings. • Comparisons of the principles, production and uses of ionising radiation techniques in medical applications. • Comparisons of the principles, production and uses of non-ionising radiation techniques in medical applications. • Labelled diagrams/flow charts showing the principles and production of ionising radiation. • Labelled diagrams/flow charts showing the principles and production ionising and non-ionising radiation. • Explanation of how the principles and production of ionising and non-ionising radiation technologies are used in medical applications. • Explanation of why ionising and non-ionising radiation technologies are used for diagnosis and treatment of medical conditions.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
AB. D1	Justify the choice of non-ionising and ionising radiation techniques in medical applications.
A. M1	Compare the principles, production and uses of different non-ionising radiation techniques in medical applications.
A. P1	Explain how the principles and production of non-ionising radiation technologies are used in medical applications.
A. P2	Explain why non-ionising radiation technologies are used for diagnosis and treatment of the human body
B. M2	Compare the principles, production and uses of different ionising radiation techniques in medical applications.
B. P3	Explain how the principles and production of ionising radiation technologies are used in medical applications.

B. P4	Explain why ionising radiation technologies are used for diagnosis and treatment of the human body.
Sources of information to support you with this Assignment	http://www.guysandstthomas.nhs.uk/our-services/radiology/types/specialties.aspx http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/ucm115357.htm https://www.gov.uk/government/collections/medical-radiation-uses-dose-measurements-and-safety-advice http://www.hse.gov.uk/radiation/nonionising/ https://www.rcr.ac.uk/policy-public-and-media/public-and-patients/educational-resources/proton-beam-therapy-pbt http://www.sor.org/about-radiography/patient-information/overview-radiotherapy http://www.cancerresearchuk.org/about-cancer/causes-of-cancer/cancer-controversies/x-rays-body-scans-and-radiation